OCCURRENCE OF *ANOPHELES CULICIFACIES* SPECIES A IN IRAN

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ABSTRACT. Polytene chromosome preparations of the ovarian nurse cells of *Anopheles culicifacies* females collected in 6 different parts of Baluchistan, Iran, during September–October 1987 and May–June 1988 revealed the existence of species A in this country. The chromosome arms are homosequential with those of species A of India. This report confirms the distribution of species A in Iran.

Malaria is still the most important parasitic disease in Iran. Annual prevalence rates average 30,000–40,000 cases with 80–85% of the cases occurring in the south and southeastern parts of the country, bounded by Jiroft (Kerman Province), Minab (Hormozgan Province) and Baluchistan (Sistan and Baluchistan Province) (Zaim 1987). In 1989, 25,044 of 58,472 cases of malaria in Iran came from the province of Sistan and Baluchistan, of which 90.2% were recorded from the districts of Iranshahr and Chabahar. *Anopheles culicifacies sensu lato* (*s.l.*) is regarded as the main vector of malaria in these latter areas.

Anopheles culicifacies s.l. has a very wide distribution, extending from Ethiopia, Yemen, Oman, United Arab Emirates, Iran and Afghanistan in the west, through Pakistan, India, Bangladesh, Myanmar, Thailand, Laos and Vietnam in the east. It is also found in Nepal and southern China in the north and Sri Lanka in the south (Subbarao 1988). In this taxon, 4 reproductively isolated populations have been found, designated as species A, B (Green and Miles 1980), species C (Subbarao et al. 1983) and species D (Vasantha et al., unpublished data—in Subbarao 1988). They can be distinguished by the species-specific paracentric inversions in the polytene chromosomes of the ovarian nurse cells. The objective of this study was to identify the sibling species of *An. culicifacies* that occur in Iran as a prerequisite for extensive studies underway on the ecology and vector potential of this taxon in the province of Sistan and Baluchistan.

Indoor resting *An. culicifacies* females were collected with suction tubes from 6 locations in Baluchistan: Sarbaz, Rask, Iranshahr, Ghasreghand and Chabahar, during September–October 1987 and Ghasreghand, Nikshahr and Chabahar, during May–June 1988 (Fig. 1). Mosquitoes were dissected in 0.075 M KCl and stage III ovaries were transferred to the laboratory in Carnoy's fixative in vials and placed in an ice box. After staining the ovaries with acetolacton orcein, they were transferred to a clean slide and were covered with a 22-mm^2 cover slip (Green and Hunt 1980). A gentle squash spread the polytene chromosomes. The slide preparations were examined at 100× magnification and sibling species were identified with the help of the diagnostic inversion karyotypes described by Subbarao et al. (1988a).

A total of 264 slides were prepared, of which 40 were compared with the polytene chromosome of the *An. culicifacies* sibling species. All specimens were identified as species A and represented collections from Sarbaz, Rask, Iranshahr (September–October 1987) and Ghasreghand, Nikshahr and Chabahar (May–June 1988). The chromosome arms of these specimens were homosequential with those of species A, described from India.

The distributions of the sibling species of *An. culicifacies* have been studied extensively in India where in most areas 2 or more species were found in sympatry. Species A and B were sympatric in the northern and southern parts of India, with species A predominating in the north and species B in the south (Subbarao et al. 1988a). In eastern India, species B either predominated or was the only species present (Subbarao et al. 1988b). Species C was found in western and eastern India in sympatry with species B, while species D was found in sympatry with species A and B in the state of Rajasthan in northwest India and with species A, B and C in the central states.

Outside India, however, cytogenetically confirmed distribution data are limited. Species B has been reported from Sri Lanka (Green and Miles 1980), northeastern Pakistan (Mahmood et al. 1984) and Nepal (World Health Organization 1983), while species A has been found in northeastern Pakistan (Mahmood et al. 1984), Oman and the United Arab Emirates (Akoh et al. 1984). The present report confirms the distribution of *An. culicifacies* species A in Iran. Although this finding corresponds well with ecological and epidemiological data available from

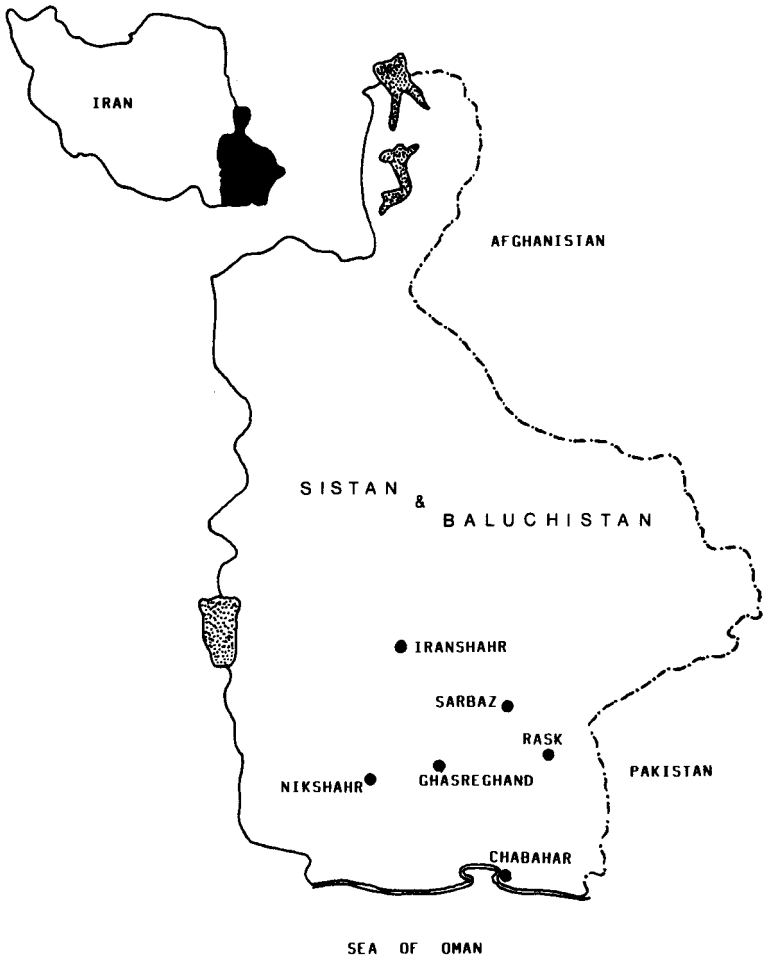

Fig. 1. Collection sites of *Anopheles culicifacies* in the province of Sistan and Baluchistan, Iran (1987–1988).

the Baluchistan area, this limited study does not preclude the existence of other sibling species in this area.

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